

CLAIMS

1. A filtration device comprising at least one well, one or more pieces of filter, a filter retention device within the depth of the well and a mechanical interlock, said interlock being formed from at least a portion of an inner wall of the well and wherein the interlock remains attached to and as a portion of the inner wall.
2. The device of claim 1 wherein at least a portion of the inner wall is tapered inwardly as it progresses from the top of the well toward the bottom of the well.
3. The device of claim 1 wherein at least a portion of the inner wall is tapered inwardly as it progresses from the top of the well toward the bottom of the well and wherein the taper is from about 0 degrees toward the vertical center line of the well to about 20 degrees toward the vertical center line of the well.
4. The device of claim 1 wherein at least a portion of the inner wall is tapered inwardly as it progress from the top of the well toward the bottom of the well and wherein the taper is about 7 degrees toward the vertical center line of the well.
5. The device of claim 1 wherein at least a portion of the inner wall is tapered outwardly as it progresses from the top of the well toward the bottom of the well and wherein the taper is from about 0 degrees toward the vertical center line of the well to about -20 degrees toward the vertical center line of the well.
6. The device of claim 1 wherein at least a portion of the inner wall is tapered outwardly as it progress from the top of the well toward the bottom of the well and wherein the taper is about -7 degrees toward the vertical center line of the well.
7. The device of claim 1 wherein the filter retention device is selected from the group consisting of underdrains, shelves, rims, lattice supports, undercuts and combinations thereof.
8. The device of claim 1 wherein the filter retention device is an underdrain.
9. The device of claim 1 wherein the device is made from a single molded plastic piece and the filter retention device is an integrally formed underdrain containing one or more openings.
10. The device of claim 1 wherein the one or more pieces of filter are made from a material selected from the group consisting of glass, polymer, metal, paper and ceramic.

11. The device of claim 1 wherein the one or more pieces of filter are made from a polymeric material selected from the group consisting of nitrocellulose, cellulose acetate, polysulphones, polyethersulphones, polyarylsulphones, polyvinylidene fluoride, polyolefins, nylons, polyamides, PTFE resin, thermoplastic fluorinated polymers and polycarbonates.
12. The device of claim 1 wherein the device is made of a material selected from the group consisting of styrene acrylonitriles, polyolefins, polycarbonates, styrene homopolymers and copolymers, PTFE resins, blends of polyolefins with small amounts of PTFE resins, ABS, acrylic resins, methacrylic resins and copolymers of either, BAREX® resin, nylons, epoxies, polyurethanes and reinforced resins.
13. The device of claim 1 wherein the mechanical interlock is one or more skives.
14. The device of claim 1 wherein the mechanical interlock is one or more skives formed continuously from a portion of the wall.
15. The device of claim 1 wherein the mechanical interlock is one or more crimps formed continuously from a portion of the wall.
16. The device of claim 1 wherein the device has a number of wells selected from the group consisting of 96, 384 and 1536.
17. A method for securing a filter within a filtration device, comprising selecting a filtration device with one or more wells, each well having an inner wall, one or more filters retained within each well of the device and skiving a portion of the inner wall to form a mechanical interlock that forms an interference fit with the filter and fixes the one or more filters to the device.
18. The method of claim 17 wherein the portion of the wall is skived by a punch having a diameter greater than that of the inner diameter of the inner wall of the well above and adjacent the filter.
19. The method of claim 17 wherein the portion of the wall is skived by a punch having a diameter greater than that of the inner diameter of the inner wall of the well above and adjacent the filter and at least one cutting surface to form the mechanical interlock.
20. The method of claim 17 wherein the portion of the wall is skived by a punch having a diameter greater than that of the inner diameter of the inner wall of the well above and adjacent the filter and at least two cutting surfaces to form the mechanical interlock.

21. The method of claim 17 wherein the portion of the wall has an outward taper as it progresses from a top of the well toward the filter in the well and inner wall is skived by a expandable punch that upon expansion has a diameter greater than that of the inner diameter of the inner wall of the well above and adjacent the filter and the punch forms at least one cutting surface to form the mechanical interlock.
22. The method of claim 17 wherein the inner wall of the well is heated either before or during the skiving.
23. The method of claim 17 wherein the inner wall of the well is heated during the skiving.